

APPENDIX TO FORM PTO SB 57

BOX REEXAM

Commissioner for Patents

Washington, D.C. 20231

Sir:

Reexamination under 35 U.S.C. Sections 302-307 and 37 CFR Section 1.510 is requested of United States Patent No. 6,195,648, which issued on February 27, 2001 to Simon, Simon and Mueller (the "Simon patent"). The Simon patent is still enforceable.

I. Claims for Which Reexamination Is Requested

Reexamination is requested of claims 1-2 of the Simon patent in view of the following patents:

U.S. Patent No. 4,335,370 to Scalley et al., issued June 15, 1982;
U.S. Patent No. 4,624,578 to Green, issued November 25, 1986;
U.S. Patent No. 4,700,296 to Palmer, Jr. et al., issued October 13, 1987;
U.S. Patent No. 5,495,531 to Smiedt, issued February 27, 1996;
U.S. Patent No. 5,510,780 to Norris et al., issued April 23, 1996;
U.S. Patent No. 5,775,290 to Staerzl et al., issued July 7, 1998;
U.S. Patent No. 5,969,633 to Rösler, issued October 19, 1999;
U.S. Patent No. 6,380,848 to Weigl et al., issued April 30, 2002;

the following published patent application:

PCT Patent Application PCT/DE95/01514 of Weigl et al., Publication No. WO 96/16845, published June 6, 1996 (in German);

and the following additional publications:

Article: "Pager Lets You Locate Your Car, Unlock And Start It", published December 10, 1997 in *USA Today*;

Article: "Electronic Keys Keep Tabs On Late Payers", published December 22, 1997 in *Nonprime Auto News*;

"PASSTEC Device Safely Prevents Vehicles From Starting", published July 19, 1999 in *Used Car News*;

Payment Clock Disabler advertisement (from Internet) published May 18, 1998;

Payment Clock Disabler advertisement (from Internet) archived January 28, 1999;
and

Declaration of Stanley G. Schwartz with Attachments 1-5, the attachments being a letter, promotional materials and an installation diagram and instructions relating to the PASSTEC product (with the Declaration demonstrating that these PASSTEC documents were published prior to August 10, 1998).

II. Documents Submitted

Attached is a copy of the Simon patent, a copy of PTO Form 1449 listing the above patents and published patent application, and a copy of each cited patent, the published Weigl PCT application, and the other documents listed in Section I above.

The published PCT application is in German, and the Weigl et al. U.S. Patent No. 6,380,848 (the "Weigl patent") is the English-language translation to the PCT publication ("Weigl PCT"), thus meeting the requirement for an English translation of all necessary and pertinent parts of the publication under 37 CFR Section 1.510(b)(3). Since the disclosures of the Weigl patent and Weigl PCT publication are equivalent, reference may be made generally to "Weigl", with specific citations made to the Weigl patent or Weigl PCT text as appropriate.

Appendix A attached hereto is a claim chart applying the prior art to the Simon claims. Also attached for reference is Appendix B, which is a copy of Search Report in a United Kingdom patent application (GB 2 356 727) dated March 19, 2001, wherein the

Norris and Palmer patents were cited. This Search Report is discussed in Sections IV.A and IV.D below.

The articles and product documents listed in above are discussed in Section IV.F below, and represent publications that teach various steps and elements of the Simon patent claims. The Schwartz Declaration establishes the date of publication of the documents attached to that Declaration.

III. The Simon Patent

The Simon patent includes two claims, both relating to enabling and disabling a motor vehicle in responses to payments being timely made, claim 1 being a method claim and claim 2 being an apparatus claim.

Claim 1 of the Simon patent reads as follows:

1. A method of enabling and disabling a motor vehicle in response to payments being timely made, comprising the steps of:
 - 1(a) computing a payment due deadline of a loan agreement for said motor vehicle;
 - 1(b) generating a reference code which corresponds to said deadline;
 - 1(c) providing said reference code to a comparator via a computer interface;
 - 1(d) receiving an additional code, via a keypad, from a user;
 - 1(e) passing said additional code to said comparator;
 - 1(f) comparing said additional code with said reference code;
 - 1(g) disabling a system which supports causing ignition in an engine of said motor vehicle, if agreement between said additional code and said reference code is not detected prior to said payment due deadline, wherein said system includes only components not dedicated to directly causing a spark to initiate combustion; and
 - 1(h) enabling said system if agreement between said additional code and said reference code is detected.

Claim 2 of the Simon patent reads as follows:

2. A system for enabling and disabling a motor vehicle in response to timely payments being made comprising:

- 2(a) a disabling module connected to a system that supports causing ignition in an engine of said motor vehicle;
- 2(b) a control module in communication with said disabling module; and
- 2(c) means for periodically receiving a code from a keypad and transmitting said code to said control module,
- 2(d) wherein said control module comprises:
- 2(e) a comparator;
- 2(f) a reference code providing module, said comparator being operable for comparing reference codes with received codes and triggering events in response thereto, and
- 2(g) said reference code providing module being operable for periodically providing reference codes to said comparator wherein said reference codes correspond to payments which are to be made;
- 2(h) wherein said disabling module disables the system that supports causing ignition when said code is not in agreement with said reference code before a predetermined time exceeds a predetermined deadline, and
- 2(i) wherein the system that supports causing ignition includes only components not dedicated to directly causing a spark to initiate combustion.

The step numbers of claim 1 and element numbers of claim 2 have been inserted for convenient reference.

IV. Substantial New Questions of Patentability

As discussed in greater detail below, both claims 1 and 2 are anticipated under 35 U.S.C. Section 102(b) by several of the above references, and are obvious under 35 U.S.C. Section 103 in light of combinations of certain of these references.

Substantial new questions of patentability are raised in that most of the cited art was not before the Examiner during prosecution of the Simon patent; and the only patent listed in Section I above that was before the Examiner (the Rösler patent) was considered to lack features that, it will now be seen, are taught by several of the other references.

The following list summarizes these points:

Scalley Patent

*Not before Examiner during prosecution of the Simon patent

- *Provides clarification of certain claim terms
- *Makes claims 1 and 2 obvious, in combination with other art

Palmer Patent

- *Not before Examiner during prosecution of the Simon patent
- *Makes both claims 1 and 2 obvious, in combination with other art

Smiedt Patent

- *Not before Examiner during prosecution of the Simon patent
- *Anticipates both claims 1 and 2

Norris Patent

- *Not before Examiner during prosecution of the Simon patent
- *Anticipates both claims 1 and 2

Staerzl Patent

- *Not before Examiner during prosecution of the Simon patent
- *Provides clarification of certain claim terms
- *Makes claims 1 and 2 obvious, in combination with other art

Rösler Patent

- *Was before Examiner during prosecution of the Simon patent
- *Feature identified by Examiner during prosecution of Simon patent as missing from Rösler is provided by each of Norris, Weigl and Smiedt
- *Makes claims 1 and 2 obvious, in combination with other art

Weigl Patent and Weigl PCT Publication

- *Not before Examiner during prosecution of the Simon patent
- *Anticipates both claims 1 and 2

Article: "Pager Lets You Locate Your Car, Unlock And Start It"

- * Not before Examiner during the prosecution of the Simon Patent.
- * Makes both claims 1 and 2 obvious in combination with other art.

Article: "Electronic Keys Keep Tabs On Late Payers"

- * Not before Examiner during the prosecution of the Simon Patent.
- * Makes both claims 1 and 2 obvious in combination with other art.

Article: "PASSTEC Device Safely Prevents Vehicles From Starting"

- * Not before Examiner during the prosecution of the Simon Patent.
- * Makes both claims 1 and 2 obvious in combination with other art.

Advertisement: Payment Clock Disabler advertisement

(From Internet and Internet Archive)

- * Not before Examiner during the prosecution of the Simon Patent.
- * Makes both claims 1 and 2 obvious in combination with other art.

PASSTEC Installation Diagram and Installation Instructions

(Attachment 5 to Schwartz Declaration)

- * Not before Examiner during the prosecution of the Simon Patent.
- * Makes both claims 1 and 2 obvious in combination with other art.

The following sections discuss the Norris, Weigl, Smiedt, Palmer, and Rösler patents. Appendix A is a claim chart demonstrating how the features of Simon claims 1 and 2 are found in the Norris, Weigl, Smiedt and Palmer patents discussed in Section IV.A-D below. The Scalley, Staerzl and Green patents are discussed in conjunction with these other patents. The Rösler patent is discussed in Section IV.E. The additional publications listed above are discussed in Section IV.F.

A. The Norris Patent

Appendix A demonstrates that each element of Simon claims 1 and 2 is found in the Norris patent, and thus these claims are anticipated under 35 U.S.C. Section 102(b). Note that the Norris patent was identified in a search report in the United Kingdom patent application corresponding to the Simon patent. In the UK Search Report attached as Appendix B, the UK Examiner cited the Norris patent as a reference over which the pending claims in that case lacked novelty.

B. The Weigl Patent

Appendix A demonstrates that each element of Simon claims 1 and 2 is found in the Weigl patent. Though it might be argued that the engine speed control system is not explicitly disclosed in Weigl as being part of the "ignition" system, the Staerzl patent demonstrates that one skilled in the art would understand that engine speed control is in fact accomplished via the ignition system. See Simon patent, step 1(g) and element 2(a).

Note that, although the Weigl patent issued in the United States after the issuance of the Simon patent, the Weigl application was originally filed in 1994 and was published (in German) under the Patent Cooperation Treaty on June 6, 1996, three years before the filing of the Simon patent application. Thus, the published Weigl application constitutes prior art under 35 U.S.C. Section 102(b). The U.S. patent is discussed in the claim chart of Appendix A because it represents the English translation of the Weigl published application.

Simon claims 1 and 2 are accordingly anticipated by Weigl under 35 U.S.C. Section 102(b).

C. The Smiedt Patent

Appendix A demonstrates that each element of Simon claims 1 and 2 is found in the Smiedt patent, and thus these claims are anticipated under 35 U.S.C. Section 102(b).

D. The Palmer Patent

As shown in Appendix A, almost every element of claims 1 and 2 of the Simon patent is found in the Palmer patent, which discloses a system designed to control access to rental appliances. Though each element is explained in Appendix A, following are a few comments highlighting patents whose disclosures are properly combinable with that of Palmer.

The Smiedt, Weigl and Norris patents, among others, teach that the controlled rented "appliance" of Palmer can be a motor vehicle. See preambles to Simon claims 1 and 2.

The entry of a code in Palmer is accomplished by the use of a punched card, but it is obvious to use a keypad for this step (see step 1(d) and element 2(c) in Appendix A), as discussed in Norris.

Element 2(a) of the Simon patent relates to a disabling module connected to a system that causes ignition in a motor vehicle engine. As noted above, the Palmer disclosure is applicable to motor vehicles, and in particular the relay in Palmer could be used to control a portion of the electrical system of an automobile.

Claims 1 and 2 are thus obvious under 35 U.S.C. Section 103(a) over Palmer in light of Smiedt, Weigl, Norris and/or Green (see Appendix A, preamble to claim 1) as well as other prior art disclosing access control to rented vehicles.

Like the Norris patent, the Palmer patent was identified in the UK Search Report attached as Appendix B, in which the UK Examiner cited Palmer as a reference over which the pending claims in that case lacked novelty.

E. The Rösler Patent

The Rösler patent was discussed by the Examiner during prosecution of the Simon patent, and formed the basis for rejection of all of the originally submitted claims. See the Office Action dated November 10, 1999.

The features of the Rösler patent were addressed both in an Examiner's interview on April 27, 2000 (and the Interview Summary, form PTO-413) and in the Reasons for Allowance attached to the Notice of Allowability dated May 11, 2000. These documents are discussed below.

1. *Inhibiting a system "not directly causing a spark"*

An Examiner's interview was conducted on April 27, 2000, during which the applicant (now patentee) argued that the Rösler system "did not compute a reference code based on payment of deadline for a loan agreement for a motor [vehicle] wherein a system not directly causing a spark will be disabled if an additional code is not detected prior to the payment due deadline".

The disabling of a system that "includes only components not dedicated to directly causing a spark to initiate combustion", which is reflected in step 1(g) and element 2(i) in the Simon patent, is taught by both Weigl and Staerzl. Weigl discusses at several points how the disclosed vehicle control system can be used to limit the operation of a vehicle such as a rental vehicle, i.e. reduce its performance without actually disabling spark generation. For instance, at col. 4, lines 18-22 (Weigl PCT, page 8, lines 17-22), the Weigl patent states that the blocking control device 30 "limits the use of the vehicle", and specifically it "reduces the maximum possible rotational speed of the motor, for example, or limits the top speed". See also Weigl patent, col. 5, lines 53-58 (Weigl PCT, page 11, lines 29-35), and col. 6, lines 21-23 (Weigl PCT, page 12, lines 33-36).

Similarly, Staerzl discloses in detail a system designed for limiting acceleration of a vehicle's engine (e.g. a boat engine) by inhibiting operation of the ignition coil. Staerzl, col. 1, line 67 - col. 2, line 4; and col. 3, lines 13-15.

Incidentally, there was no disclosure in the Simon patent application as originally filed for the limitation that the system "includes only components not dedicated to directly causing a spark to initiate combustion" (this feature was introduced in the Amendment dated May 5, 2000); and thus there is no definition or clarification of this term. It is possible that this term ("not dedicated to directly causing a spark") was intended to refer to the ignition primary (see Simon, col. 6, lines 17-20). In any case, both Weigl and Staerzl teach the feature of disabling components that do not directly

cause a spark, which was thought at the time of the Examiner's interview to be lacking in the prior art.

2. Requirement that a reference code be entered before payment deadline

The Interview Summary of April 27, 2000 concluded that the "system is unlike the prior art which appears to require the use of an additional code for each use of the protected system". In addition, in the Reasons for Allowance (in paragraph 5 of the Notice of Allowability dated May 11, 2000), it was concluded that:

[T]he distinctive feature of Applicant's invention is the requirement of reference code be entered on loan payment agreement prior to payment due deadline to prevent the vehicle to be disabled.

The prior art listed above demonstrates that this feature was well known to those skilled in the art more than a year before the filing of the Simon application. For instance, the Norris patent states that the equipment is "normally operative until such time as a lease or payment period expires. Only after the expiration of the time period is the equipment 43 made inoperative until the entry of a valid activation signal." Norris, col. 5, lines 21-25. As discussed above, Norris anticipates the Simon patent under 35 U.S.C. Section 102(b). It also combines with the teaching of the Rösler patent to make the Simon patent obvious under 35 U.S.C. Section 103(a).

Similarly, the Weigl patent teaches a system in which, when a maximum vehicle use parameter -- e.g., a length of rental time -- has been reached, the system checks for new release information, and if the new release information is not found, vehicle operation is first limited and then blocked. Weigl patent, col. 4, lines 4-34 (Weigl PCT, page 7, line 36 - page 8, line 34).

As noted above, Weigl anticipates Simon claims 1 and 2 under 35 U.S.C. Section 102(b). In combination with the Rösler patent, it also makes these claims obvious under 35 U.S.C. Section 103(a).

In addition, the Smiedt patent teaches a system wherein, when a host device (e.g. a motor vehicle) is switched on, a controller checks whether a payment has been made for the current period. Once a cut-off date is reached, the host device is disabled. Smiedt, col. 1, lines 49-54 and col. 6, lines 48-54.

Thus, the Smiedt patent both anticipates Simon claims 1 and 2 under 35 U.S.C. Section 102(b) (see Section IV.B above) and in combination with the Rösler patent makes these claims obvious under 35 U.S.C. Section 103(a).

Accordingly, claims 1 and 2 are obvious over Rösler in light of any of Norris, Weigl and Smiedt.

F. Additional References

The following references are submitted as showing the existence in the prior art of various features recited in Simon Claims 1 and 2. These prior art references are properly combinable with the patents discussed above, e.g. with Rösler, to further demonstrate the obviousness of the Simon claims.

The December 10, 1997 article "Pager Lets You Locate Your Car, Unlock And Start It" discloses a pager system for use by car loan companies to enforce car loan payments. This article relates to step 1(g) and element 2(h) of the Simon patent, in that it discusses cutting the engine in response to failure to make timely loan payments.

The December 22, 1997 article "Electronic Keys Keep Tabs On Late Payers" (from Nonprime Auto News) and the July 19, 1999 article "PASSTEC Device Safely Prevents Vehicles From Starting" (from Used Car News) both disclose the prior art PASSTEC device, which is used as a security system and to enforce car loan payments. This article relates to step 1(g) and element 2(h) of the Simon patent, in that the PASSTEC device disables a starter in response to failure to make timely loan payments.

The attached Payment Clock Disabler advertisement from the Internet is dated May 18, 1998. Attached also is a printout from the Internet archive "Wayback Machine". This Internet archive (found at <http://www.archive.org>) verifies that this advertisement was published on the Internet at least as early as January 28, 1999. The URL at the bottom of the printout includes the date code 19990128, which shows when this page was archived. This article relates to steps 1(a) and 1(b) as well as element 2(g) of the Simon patent, in that it discloses calculating when payments are due, using codes to extend payment, and enabling and disabling the vehicle in response to timely payments.

The PASSTEC device is a starter disabler, as shown in the above articles and in the Installation Diagram and Installation Instructions attached as Attachment 5 to the Schwartz Declaration (Appendix C). The Schwarz Declaration demonstrates that the Installation Diagram and Installation Instructions were published more than a year before the filing date of the Simon patent. The PASSTEC documents (Attachments 1-5 to Schwartz Declaration) relate to step 1(g) and element 2(h) of the Simon patent, in that they disclose disabling a vehicle in response to failure to make timely loan payments.

V. Conclusion

Both in the United Kingdom search report and in an additional validity search relating to Simon claims 1 and 2, significant and extensive prior art has been located that anticipates these claims under 35 U.S.C. Section 102(b) and/or makes the claims obvious under 35 U.S.C. Section 103(a).

The Norris, Weigl and Smiedt patents are particularly close, and the Simon claims lack novelty over each of these references. The Palmer patent is also quite close, lacking only the explicit teaching of the controlled equipment being a "vehicle", which is taught by numerous other references, including Norris, Weigl and Smiedt.

Though the Rösler patent was considered by the Examiner during prosecution of the Simon application, it was mistakenly concluded in the Reasons for Allowance that there was no prior art teaching "the distinctive feature of Applicant's invention", namely that the "reference code be entered based on [the] loan payment agreement prior to [the]

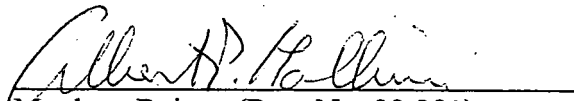
payment due deadline" to prevent the vehicle from being disabled. This feature is found repeatedly in the prior art submitted herewith, again notably in Norris, Weigl and Smiedt, and thus Rösler in combination with any of these references makes claims 1 and 2 obvious.

The advertisements, articles and PASSTEC device descriptions are all publications that show various features of the Simon claims, which further combine with the other art cited above -- e.g. Norris, Weigl, Smiedt and/or Palmer -- to render these claims obvious.

The patents, Weigl PCT publication and the other publications submitted herewith thus not only raise substantial new questions of patentability, but make it clear that claims 1 and 2 of the Simon patent should be rejected over this art both under 35 U.S.C. Section 102 and 35 U.S.C. Section 103.

Respectfully submitted,

Date: April 10, 2003


Matthew Rainey (Reg. No. 32,291)
Albert P. Halluin (Reg. No. 25,227)

HOWREY SIMON ARNOLD & WHITE, LLP
301 Ravenswood Avenue
Box No. 34
Menlo Park, CA 94025
(415) 848-4950



US006195648B1

(12) **United States Patent**
Simon et al.

(10) Patent No.: **US 6,195,648 B1**
(45) Date of Patent: **Feb. 27, 2001**

(54) **LOAN REPAY ENFORCEMENT SYSTEM**

(76) Inventors: **Frank Simon**, 31959 Via Ararat,
Bonsall, CA (US) 92003; **Mike Simon**,
2404 Gird Rd., Fallbrook, CA (US)
92028; **Ron Mueller**, 4027 Bonita View
Dr., Bonita, CA (US) 91902

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/371,697

(22) Filed: **Aug. 10, 1999**

(51) Int. Cl.⁷ **G06F 17/30**

(52) U.S. Cl. **705/40; 705/13; 235/382;
235/384; 340/825.31; 340/825.33; 340/825.34**

(58) Field of Search **705/13, 40; 235/382,
235/384; 340/825.31, 825.33, 825.34**

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,665,397	5/1972	De Napoli et al. .
3,790,933	2/1974	Cort .
3,987,408	10/1976	Sassover et al. .
4,067,411	1/1978	Conley et al. .
4,177,466	12/1979	Reagan .
4,291,237	9/1981	Kitano .
4,327,353	4/1982	Beard et al. .
4,366,466	12/1982	Lutz .
4,381,705	5/1983	Roes et al. .
4,463,340	7/1984	Adkins et al. .
4,553,511	11/1985	Hayakawa et al. .
4,616,208	10/1986	Nakamura .
4,624,578	11/1986	Green .
4,630,201 *	12/1986	White 364/408
4,777,377	10/1988	Jeter .
4,804,937	2/1989	Barbiaux et al. .
4,805,722	2/1989	Keating et al. .
4,926,332	5/1990	Komuro et al. .
4,990,890	2/1991	Newby .
4,995,086	2/1991	Lilley et al. .
5,023,605	6/1991	McColl .
5,089,762	2/1992	Sloan .

5,124,920	6/1992	Tamada et al. .	
5,289,369 *	2/1994	Hirshberg	364/401
5,396,215	3/1995	Hinkle .	
5,491,325 *	2/1996	Huang et al.	235/379
5,519,260	5/1996	Washington .	
5,594,284 *	1/1997	Hill et al.	307/10.5

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

0320470 *	6/1989	(EP)	B60R/25/10
58-180349	10/1983	(JP) .	
WO 96/19360 *	6/1996	(WO)	B60R/25/10

OTHER PUBLICATIONS

Bohn, "Anti-theft systems attract dealers", Automotive News, P.57. Dialog File 16, Access No. 02727658, 2/1993.*
White, J., "Repo Man's good news is bad for others—rise in delinquent car loans portends slowdown", Wall Street Journal, New York, 11/1988.*

Edgerton, J., "This anti-theft device may cut your car insurance bill by up to 25%", Money, New York, 11/1997.*
Brewer, D., "Bad loans and legal remedies", Credit Union Management, Madison, Abstract, pp. 22-, 4/1996.*

Primary Examiner—Edward R. Cosimano

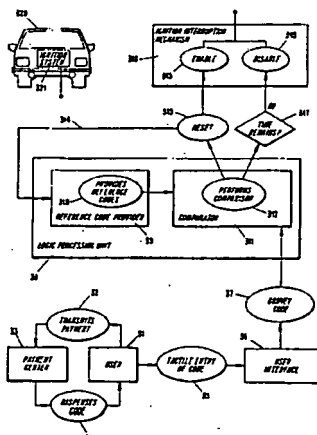
Assistant Examiner—Tongoc Tran

(74) *Attorney, Agent, or Firm*—Burns, Doane, Swecker & Mathis, L.L.P.

(57) **ABSTRACT**

A system to encourage on time repayment of loans includes electronic apparatus coupled to a critical system of certain equipment; for example, the ignition system of an automobile. Apparatus includes mechanism whereby a user-operator is able to enter a code. Entry of a correct code serves as indication that a payment has been made and enables further use of the equipment. On failure to timely make payments, a user is prevented from using the equipment as the apparatus is arranged to disable the equipment by way of the critical system to which it is coupled. Both a user-operator interface and critical system interruption circuit are coupled to a logic processor which is easily mounted onto equipment subject to the program.

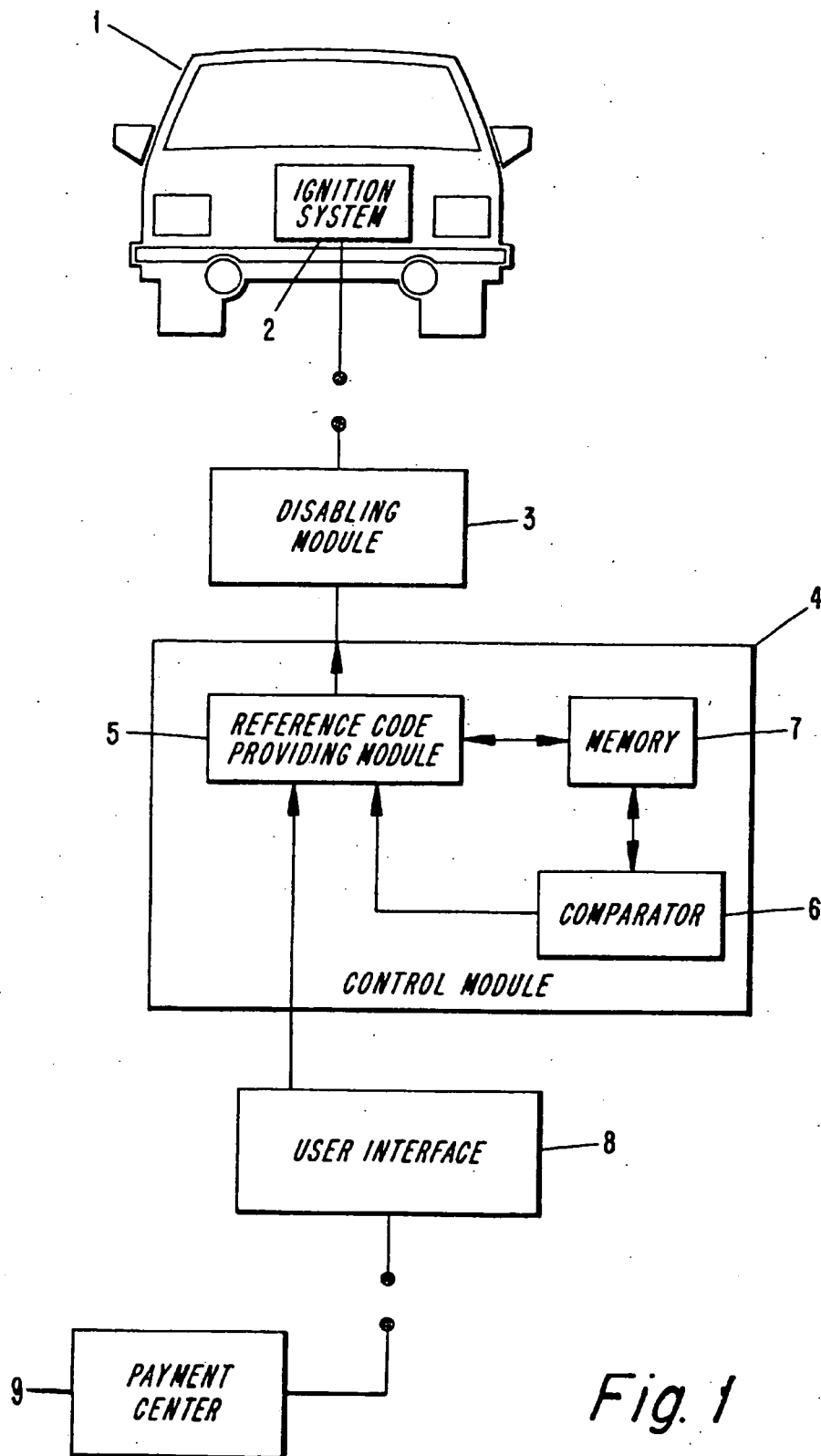
2 Claims, 3 Drawing Sheets

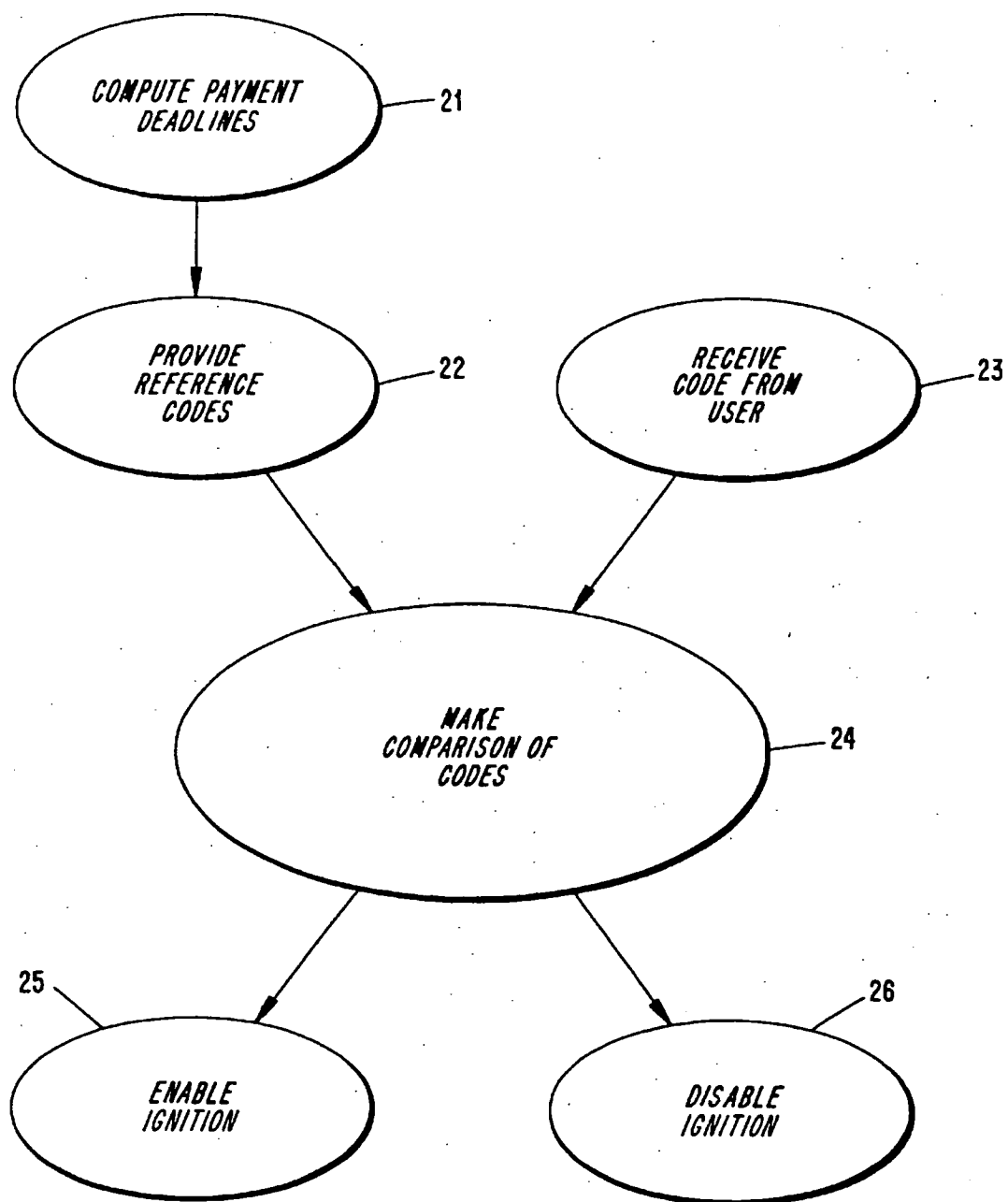


U.S. PATENT DOCUMENTS

5,602,426	*	2/1997	Ecker	307/10.2	5,841,363	*	11/1998	Jakob et al.	340/825.31
5,631,962	*	5/1997	Balph et al.	380/25	5,867,802		2/1999	Borza	
5,661,451		8/1997	Pollag		5,930,777	*	7/1999	Barber	705/17
5,665,397		9/1997	Fisher et al.		5,942,985	*	8/1999	Chin	340/825.31
5,686,765		11/1997	Washington		5,945,906	*	8/1999	Onuma	340/425.5
5,715,905		2/1998	Kaman		5,964,877	*	10/1999	Victor et al.	713/202
5,812,067		9/1998	Bergholz et al.		5,969,633	*	10/1999	Rosler	340/825.34
5,812,252		9/1998	Bowker et al.		5,973,411	*	10/1999	Tado et al.	307/10.5
5,819,869		10/1998	Horton						

* cited by examiner



*Fig. 2*

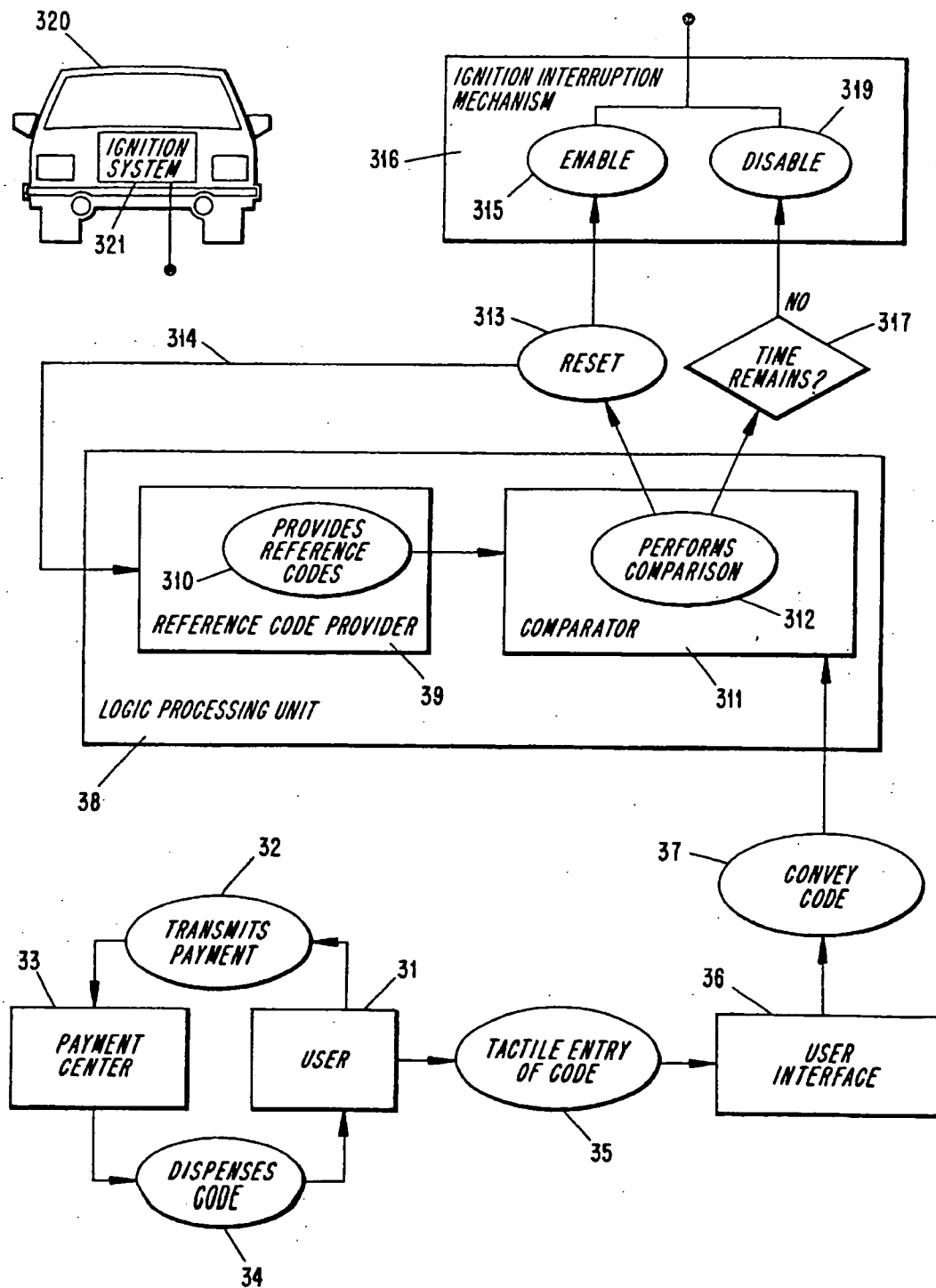


Fig. 3

LOAN REPAY ENFORCEMENT SYSTEM

BACKGROUND OF THE INVENTION

1. Field

The following invention disclosure is generally concerned with electronic systems for disabling equipment in response to failure to make timely payments on a corresponding loan.

2. Prior Art

Systems have been introduced to interrupt the ignition system of an automobile on a regular, timed interval. To re-enable the car, a user is required return to a payment center, make a payment, and have an agent reset the interrupt mechanism for a renewed timed interval. The system can only be reset by an authorized agent as it requires a key held in escrow at the payment center. While the system is effective in encouraging customers to repay their auto loans in timely fashion, it has extreme overhead considerations. The system requires a customer to travel to the payment center each payment period of the loan. Of course, this prevents the user from taking extended travel without first making an advanced payment. In addition, a user must arrive at the payment center during the hours in which it is open. Still further, a user must wait to receive the attention of the agent. As these problems pose considerable inconvenience, these systems suffer from limited utility. It is desirable to automate the reset process so a user is not required to travel to a payment center.

Monthly payments to utility companies are made with very high reliability. This is partly due to the threat of service cut-off. Failure to pay a phone bill, will result in loss of telephone services. Thus, phone bills are paid regularly because failure to do so has immediate and tangible results. Monthly payments on an automobile loan are not likely to be as regular. Although a car may be repossessed, the process is expensive and complex and thus the threat of doing so is less immediate than telephone service cut-off. To encourage reliable loan re-payments, it is desirable to have a 'service' cut-off for equipment related to loans.

Techniques have been discovered which provide very novel uses of automobile ignition interruption systems, particularly with respect to those which may be reset with minimal intrusion and burden upon a user's freedom. While systems and inventions of the art are designed to achieve particular goals and objectives, some of those being no less than remarkable, these inventions have limitations which prevent their use in new ways now possible. These inventions are not used and cannot be used to realize the advantages and objectives of the present invention.

SUMMARY OF THE INVENTION

Comes now, Frank Simon, Mike Simon, and Ron Mueller with an invention of a loan repayment system including devices for and methods of interrupting a critical system of equipment in response to failure to make timely payments.

A critical system interruption circuit in communication with a logic processing unit operates to disable and enable equipment in response to loan payments being timely made. When a user makes a payment on an outstanding loan, usually a loan related to the equipment, a logic processor is notified of the action. The logic processor drives a switch coupled to a critical system interruption means to enable or disable the equipment in accordance with payment receipt.

In some preferred versions, when a user makes a payment on an outstanding car loan, a code is released to the user. The user then operates a user-operator interface connected to a

logic processing unit to convey the code. Once the code is verified, the logic processing unit manipulates the automobile ignition interruption circuit to enable the car.

In example, an ignition interruption circuit is arranged to disable and enable an automobile in response to loan payments being timely made. When a user makes a loan payment, the code is released to the user from a payment center. The user operates a user interface to convey the code to a logic processing unit. Upon verification, the logic processing unit operates an interruption circuit to enable the automobile for further use. Thus it becomes possible to interrupt service of equipment in response to failure to timely receive payments on a loan associated with the equipment.

In agreement, apparatus of the invention include: a critical system interruption circuit operable for enabling and disabling a critical system of certain equipment; a logic processing unit having a reference code generation and storage facility and comparator. And in some versions, a user interface operable for receiving a numeric code from a user and conveying that numeric code to the logic processing unit is included.

Methods of the invention may be summarized as those which include the steps: computing a payment due deadline, generating a reference code which corresponds to the deadline, receiving a code at a logic processing unit, comparing the received code to the reference code, disabling a critical system if a correct code is not received before a present time exceeds a payment due deadline; enabling a critical system on receipt of correct code; and computing subsequent payment due deadline and generating a reference code which corresponds to the subsequent deadline.

In some preferred uses of systems of the invention, a user who purchases a car from a dealer agrees to have the system installed on the purchased automobile to protect the lender from late payments on an outstanding loan. On initiation, parameters which relate to loan terms, for example total number of payments and payment interval, are loaded into a system memory from a server unit. The logic processing unit computes a deadline time which corresponds to the due date and time for receipt of a payment. When a user makes a payment on time in agreement with loan terms, the payment agency releases a predetermined alpha-numeric code to the user. The user then enters the code via a user interface so that the logic processing unit can process the code for verification. If the code matches a reference code stored or generated within the device, then the logic processing unit puts the ignition interruption circuit in a state which enables the car's ignition system. A user who fails to make a payment will not receive the code necessary to 'unlock' the system. If the user fails to enter the proper code by the time the deadline passes, the car is put into a disabled state by way of interruption of the ignition until payment is made. Thus the logic processing unit is provided an indication that timely payment was made via receipt of a correct code.

The invention thus stands in contrast to methods and devices known. The invention includes a critical system interruption mechanism which can be operated without being returned to the payment center. Systems of the art require returning to a payment center.

OBJECTIVES OF THE INVENTION

It is a primary object of the invention to provide systems to improve timely repayment of a loan.

It is an object of the invention to provide a system which can be operated without having to bring equipment to a predetermined location.

It is an object of the invention to provide systems to enable and disable equipment in response to receipt of loan payments.

It is a further object to provide systems which interrupt a critical system of equipment in response to a failure to receive a code in due time.

A better understanding can be had with reference to the detailed description of preferred embodiments and with reference to appended drawings. These embodiments represent particular ways to realize the invention and are not inclusive of all ways possible. Therefore, there may exist embodiments that do not deviate from the spirit and scope of this disclosure as set forth by the claims, but do not appear here as specific examples. It will be appreciated that a great plurality of alternative versions are possible.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

These and other features, aspects, and advantages of the present invention will become better understood with regard to the following description, appended claims and drawings where:

FIG. 1 is a block diagram which describes arrangement of elements in an apparatus of the invention;

FIG. 2 is a block diagram which describes arrangement of steps in a method of the invention; and

FIG. 3 is a block diagram which relates methods and apparatus together.

GLOSSARY

Throughout this disclosure, reference is made to some terms which may or may not be exactly defined in popular dictionaries as they are defined here. To provide more precise disclosure, the following definition of terms are presented with a view to clarity so that the true breadth and scope may be more readily appreciated. Although every attempt is made to be precise and thorough, it is a necessary condition that not all meanings associated with each term can be completely set forth. Accordingly, each term is intended to also include its common meaning which may be derived from general usage within pertinent arts or by dictionary meaning. Where the presented definition is in conflict with a dictionary or arts definition, one must consider the context of use and liberal discretion to arrive at an intended meaning. One will be well advised to err on the side of attaching broader meanings to terms used in order to fully appreciate the depth of the teaching and to understand all intended variations.

Enable/Disable

Use of the word 'enable' or 'disable' means to cause a system to become operable or to cause a system to become inoperable in a temporary fashion whereby the state of operability may be toggled therebetween operable and inoperable states.

Payment Center

A payment center is a facility for receiving payments and dispensing codes in response to said receipt of payments. It may be an automatic or a partially automatic system whereby use of a database and dial-up access with electronic communication or radio frequency transmission of codes is fully anticipated.

Code

'Code' refers to any combination of numbers or letters or even symbols which may be represented in a digital domain such as in ASCII format; the code being represented in binary facilitates manipulation via computer processing means.

Critical System

'Critical system' refers to any system or sub-system which is necessary for the proper function of some related piece of equipment.

Ignition

'Ignition' refers to the entire electrical system of a car and all systems which support causing ignition in an engine. Although 'ignition' generally refers to the portion of electronics dedicated causing a spark to initiate combustion, for purposes of this invention, 'ignition' is to be taken quite broadly. For example, if a car is disabled because a fuel pump is rendered inoperative, or if a door or other security system is maintained in a locked condition, it is meant that 'ignition' is interrupted. One will appreciate that ignition does not occur when fuel is cut-off thus ignition is interrupted.

Logic Processing Unit

'Logic processing unit' refers to any logic processor, microcontroller, microprocessor or other computer type device operable for executing program code and performing logic operations without limitation to any particular type or class of processor.

Equipment

'Equipment' refers to machinery, instruments, and tools, both mechanical and electronic, which have systems or sub-systems which may be exposed to interruption. Equipment includes things like automobiles; machinery used in factories, such as conveyors and packaging tools; construction tools such as chain saws and jackhammers; instruments used in research facilities such as electron microscopes and spectrometers; and instruments used in hospitals, such as radiometers and gamma knives.

Automobile

The term 'automobile' is intended to include cars, trucks, tractors, cranes, boats, jet-skis, snowmobiles, motorcycles, recreational vehicles, airplanes et cetera. Each of these types of vehicles is comprised of an ignition system. Although in various parts of the invention reference is made to cars, it is to be appreciated that the invention works equally as well with other types of vehicles and thus automobile is to be interpreted without limit to cars but rather to any vehicle having an ignition system.

Nouns which are functional in nature or include the modifier: "means"

In addition to the terms described above, for purposes of this disclosure full meaning of certain nouns which are functional in nature, a 'functional noun', may be more readily appreciated in view of the following note.

A functional noun indicates that something is done, is caused, or simply occurs. Many forms of alternates may be used to accomplish the identical event. The particular choice of an object may be selected in view of a particular task at hand, however, in view of other tasks, one may choose a different object where both objects are useful in producing the mentioned function. Thus, it is not the object onto which importance be placed, but rather the function.

The essence of the invention is not changed by any particular choice of an object. Versions of the invention should not be limited to one particular type of object when a functional noun is used. The limitation described by functional noun is met when the function occurs. Therefore, by use of a functional noun it is meant that any conceivable means for causing the function is part of the invention. Experts will recognize many thousands of possible ways of accomplishing the identical function with alternative objects and it will not serve a further understanding of the invention to attempt to catalogue them. The reader will appreciate that

the broadest possible definition of a functional noun is intended here. The following are examples of nouns used herein which are functional in nature:

Reference Code Providing Means

A reference code providing means is an device which provides a reference code to a logic control processor. It may be a simple array of numbers stored in conventional memory or may be program code which executes an algorithm to generate a reference code to be provided.

Comparison Means (comparator)

A comparison means, herein 'comparator', is a device for comparing a first code to a second code and returning a binary result in agreement with the comparison. The comparison may be one which tests for coincidence between codes or one which tests for cooperation between codes. For example, if the codes are identical a binary '1' can be returned or if the codes are different but merely cooperate under some rule, a binary '1' can be returned.

Interface Means

An 'interface means', herein 'user interface', is a device which allows a user to transmit to a logic processor a code.

Interruption Means

An 'interruption means', herein 'ignition interruption circuit' or 'ignition interruption mechanism', is a device which causes interruption of critical systems of equipment.

Terms which are functional in nature like those above may be used throughout this disclosure including the claims. For example, 'means for' or 'step for' followed by a phrase describing a function. One should remain mindful that any particular object provided as an example is not meant to limit the functional noun to that example but rather the example is provided to further illustrate certain preferred possibilities. Thus the 'means for' or 'step for' should not be limited to any particular structure which may be called out but rather to any conceivable means of causing the function described to be effected. The reader will recognize it is the function to be carried out which is the essence of the invention and many alternative means for causing the function to occur may exist without detracting from any combination or combinations taught as part of the invention.

Although preferred embodiments discussed here in detail are primarily directed to automobiles, one will appreciate that other types of equipment may be equally subjected to similar programs intended to protect a lender. For example, 'equipment' may include an air conditioner where a compressor is a critical system which may be interrupted. Alternatively, equipment may be an elevator having an control module as a critical system. Thus, operation of the elevator can be controlled in response to on-time loan payments. Any equipment which exposes a critical system to an interrupt means may be coupled to systems of this invention whereby operation of the equipment can be held as encouragement to repay loan payments in accordance with loan terms. Thus the true breadth of the invention should be limited only by the claims attached hereto without regard for particular examples set forth here for illustration.

PREFERRED EMBODIMENTS OF THE INVENTION

In accordance with each of the preferred embodiments of the invention, there is provided apparatus for and methods of a loan repayment system. It will be appreciated that each of the embodiments described include both an apparatus and a method and that the apparatus and method of one preferred embodiment may be different than the apparatus and method of another embodiment.

APPARATUS OF THE INVENTION

With reference to the drawing figures a full and complete appreciation of best modes of the invention can be gained.

FIG. 1 illustrates a block diagram of basic apparatus of the invention. An automobile 1 having a standard ignition system 2 is in electrical communication with a device of this invention. The device comprising: an ignition interruption mechanism 3; in communication with a logic processing unit 4; including a reference code providing means 5, a comparator 6, and a memory 7; is further in communication with a user interface 8. A payment center 9 which provides codes to a user is also depicted. Although the automobile and payment center are not considered elements of apparatus taught here, they relate intimately therewith thus they are shown via their relationship with elements of apparatus.

Critical System Interruption Circuit

An ignition interruption circuit may be coupled to ignition wires leading from a standard ignition keyswitch. In simplest terms, the ignition interruption mechanism may be described as a circuit breaking switch. Arranged serially, either switch, the keyswitch or the ignition interruption mechanism, will operate to cause an open circuit in the ignition primary rendering the ignition disabled. An ignition interruption circuit is further in communication with a logic processing unit. The logic processing unit operates the ignition interruption circuit in accordance with events which occur there. The logic processing unit generates commands to direct the ignition interruption circuit to take either of two alternative states. A 'disabled' state corresponds to an 'open' ignition circuit while an 'enabled' state corresponds to a 'closed' ignition circuit. The logic processing unit causes the ignition interruption circuit to switch between these two states.

User Interface

A user interface is coupled to the logic processing unit in order to convey to it a code. An alpha-numeric type code such as a PIN number for example, may be transmitted from the user interface to the logic processing unit for comparison to a reference code. While preferred versions of the invention include a simple keypad for tactile entry of a numeric code by a user, other versions are possible. Tumbler combination locks, slider element devices, and point-and-click user interfaces all are examples of alternative forms of user interfaces. A user interface is provided to allow a user to convey a code to a computer. Accordingly, use of an alternative user interface will not lend novelty to any version of an apparatus not explicitly presented here. A user interface allows a user in communication with a payment center to receive codes therefrom and cause those codes to be entered and transmitted to the logic processing unit for comparison.

Logic Processing Unit

A logic processing unit may be a microcontroller of a standard sort sometimes referred to as 'off-the-shelf' devices or alternatively may be a custom designed microcircuit having specific application. Although strictly speaking a 'logic processing unit' may be distinct from support elements such as a memory, for purposes of this disclosure 'logic processing unit' is used to refer to the entire computing facility which may include a memory, a comparator and other support elements. FIG. 1 shows this relationship where a reference code providing means 5 and a comparator 6 are presented within the bounds of the microcontroller 4. The logic processing unit may include other support elements such as power supply control, read-only memory, input-output facility, and other elements typically used in conjunction with microcontrollers or microprocessors. Logic processing units of the invention are set to execute code which is predetermined at an initialization step. As the preset code is not dynamic, the logic processing unit is not con-

sidered a user-programmable device. Its purpose is to execute coded instructions which enable the functionality described herein in this disclosure.

A grace period may be included as part of the deadline for payment. Under terms of the loan, a payment becomes due at some discrete time. However, because of inconsistencies in the mails or other payment transmission difficulties, systems of the invention may be arranged to provide a grace period. A grace period allows equipment to operate normally after the time for payment has past but where no payment has been received, recorded, and reported via entry of a code. During the grace period, various indications and warnings may be provided to a user at the equipment. For example, a display may be arranged to deliver a message which indicates impending interruption. Alternatively, an audio signal may be provided to alert a user to the condition that payment is overdue.

One will appreciate that in rare cases of emergency, provision for override may be useful. For example, if a car is disabled for lack of timely payment, then a special code to be used only in case of emergency may temporarily re-enable the car. Thus a person in dire need of medical help may be transported with an otherwise disabled car when the emergency code is employed. By agreement, one can be charged heavy fines for misuse of emergency codes. In this way, non-emergency use is highly discouraged. The system is made secure against use outside designed limits while still accommodating occasional emergencies.

Fraudulent attempts to enable equipment may be accompanied by surreptitious entry of random codes. This may easily be detected at the logic processor and devices of the invention may be arranged to respond. When a predetermined number of bad code entries is detected, the system may be made to block further entry of codes. For example, when three consecutive bad codes are attempted, the system can be made to ignore further entry for a predetermined amount of time.

Some alternative versions of the invention omit use of a user interface. Where stationary equipment can easily be put into automatic communication with a payment center, for example via a simple telephone line connection, a user interface may be replaced by a modem and telephone line. The logic processing unit can then receive transmission of codes directly from the payment center without user input whatever. One will appreciate that there is nothing sacred about a telephone line hook-up and other communication means may work in similar fashion. Paging technology which transmits messages by radio frequency also works well. Equipment having a pager in communication with a logic processor unit could receive codes to activate the systems. Thus, any means of conveying a code from a payment center to a piece of equipment should be considered as part of the invention.

METHODS OF THE INVENTION

With reference to drawing FIG. 2, preferred methods of the invention include a step to compute a plurality of payment deadlines 21. In agreement with repayment terms of an automobile loan, a plurality of deadlines for receipt of payments is provided. Information relating to date and time of loan initialization, lifetime of the loan, total number of payments to be made, payment frequency, grace period, emergency override code, and perhaps other information (i.e. re-enable, reset procedures), is used for computing payment deadlines. A payment deadline represents the time by which a payment must be received at a payment center in order that the terms of the loan be met. Payment deadlines

may be computed at initialization of the (loan) system or may be computed at various times thereafter initialization. In either case, deadlines computed may be used to generate reference codes.

In some versions of the invention, a host/client relationship is established with regard to computing facility. A host which may run software appropriate for systems administration can be connected to a client computing apparatus for downloading of important data like code schemes and particular deadlines. After initialization operations, the host may be separated from the client where the client has been programmed with important code information.

A logic processing unit includes facility to provide reference codes which correspond to computed deadlines. Algorithms used to generate reference codes are well known to the payment center which supplies corresponding codes to a user. A careful observer will note that the reference code provider may be arranged to merely store an array of reference codes generated in a set-up procedure during initialization of the system. The reference codes are then periodically recalled from the memory for a comparison step. As an alternative, it is possible to generate reference codes in real time in agreement with some algorithm. For example, a useful reference code may simply be a number equal to the number of days since a predetermined date set at initialization. In either case, the reference code providing means of the logic processing unit provides a reference code 22, whether it be from memory or one generated in real time, to a comparison means or comparator.

In a parallel step 23, a code may be received from a user. This may occur at any time prior to a present payment deadline without causing interruption of the ignition. A user having made a timely payment, that payment having been properly received and logged in the payment center, is entitled disclosure of the code which releases the mechanism from causing an interruption. In preferred embodiments, a user mails a payment to the payment center in advance of the deadline. When enough time has past for the center to have received and processed the payment, the user can call the payment center on a telephone and identify the loan. In response, the payment center can check its database and verify receipt of payment. After verification, the payment center will disclose to the user the code which can be used to release the timed interrupt mechanism. Having the code, the user can then enter it via the user interface of the device. Thus, in methods of the invention, a code from a user is received at a user interface.

A comparison of codes 24 is made in the logic processing unit. Upon receipt of a code entry from a user, the logic processing unit is triggered to perform a comparison of codes. The reference code which corresponds to an immediate payment deadline is compared to the code entered by the user. Either of two results drives the next step. If there is agreement between the codes, the logic processing unit operates the interruption circuit to leave the ignition enabled 25 without interruption. If there is no agreement between the user entered code and the reference code, then the logic processing unit operates the interruption circuit to cause the ignition to be disabled 26.

It is important to note that, if agreement exists between the entered and reference codes, the result of the comparison step sets a positive indicator in the logic processing unit, which indicator must be present at the occurrence of the payment deadline to avoid causing the ignition to be interrupted.

FIG. 3 illustrates one preferred version of the entire system with more precision where steps of methods are

shown in their relationships with elements of devices. A user 31 causes a payment to be transmitted 32 to a payment center 33 where it is received and logged into records. In response to receipt of that payment, the payment center dispenses 34 a predetermined code to the user. The user then enters 35 the code via tactile entry upon a user interface 36 such as a simple keypad device. The user interface conveys 37 the code to the comparator portion of a logic processing unit 38. A reference code provider 39 provides 310 a reference code to the comparator 311. A comparison operation 312 is made to arrive at either of two distinct results. Either agreement is found with regard to the reference code and the code entered by the user, or no agreement is found. In the case of agreement, a reset operation 313 sends feedback 314 to the reference code provider to determine a new reference code which corresponds to the next payment deadline, while an enable 315 step causes the ignition interruption circuit 316 to be operated such that the ignition is enabled without regard to its prior state.

In the case where agreement is not found, an agreement indicator is left in a negative state. On arrival of a payment due deadline or end of a grace period a check of the state of the indicator is made. If the indicator is in a negative state, the ignition interruption circuit is operated to cause the ignition to be disabled 319. Devices of the invention may be coupled to an automobile 320 having a standard ignition 321.

In some preferred embodiments, when a payment deadline passes, a grace period begins. During the grace period, the user is notified via an indicator, for example a visual or an audio signal, that the grace period has been activated. During the grace period, the automobile remains operable and the ignition is not interrupted. However, the indicator serves as a warning of the impending interruption in service. If the grace period is exceeded and proper code has still not been entered, then the automobile is disabled. This embodiment is considered a mere subset of the above described systems. The grace period being a limited extension of time before interruption of the ignition occurs.

Alternative versions exist where the user interface is made redundant and is omitted entirely. For example, in the case of equipment which is an elevator or air conditioner a user interface can be eliminated and the system made automatic. A standard phone jack can be installed into the case of an air conditioner. Complete installation of the air conditioner includes plugging an active phone line into the jack. In this way, the logic processor of the air conditioner is put into communication with the payment center via a modem. The air conditioner can automatically be put into communication with the payment center on a periodic basis to receive codes which may be made available in response to receipt of payments.

One will now fully appreciate how an electronic device is arranged and operates to encourage timely loan payments by disabling an automobile ignition. Further, that the device may be reset remotely and does not require being physically present at a loan center to be properly reset. Although the

present invention has been described in considerable detail with clear and concise language and with reference to certain preferred versions thereof including the best mode anticipated by the inventor, other versions are possible. Therefore, the spirit and scope of the invention should not be limited by the description of the preferred versions contained therein, but rather by the claims appended hereto.

What is claimed is:

1. A method of enabling and disabling a motor vehicle in response to payments being timely made, comprising the steps of:

- computing a payment due deadline of a loan agreement for said motor vehicle;
- generating a reference code which corresponds to said deadline;
- providing said reference code to a comparator via a computer interface;
- receiving an additional code, via a keypad, from a user;
- passing said additional code to said comparator;
- comparing said additional code with said reference code;
- disabling a system which supports causing ignition in an engine of said motor vehicle, if agreement between said additional code and said reference code is not detected prior to said payment due deadline, wherein said system includes only components not dedicated to directly causing a spark to initiate combustion; and
- enabling said system if agreement between said additional code and said reference code is detected.

2. A system for enabling and disabling a motor vehicle in response to timely payments being made comprising:

- a disabling module connected to a system that supports causing ignition in an engine of said motor vehicle;
- a control module in communication with said disabling module; and

means for periodically receiving a code from a keypad and transmitting said code to said control module,

wherein said control module comprises:

- a comparator;
- a reference code providing module, said comparator being operable for comparing reference codes with received codes and triggering events in response thereto, and

said reference code providing module being operable for periodically providing reference codes to said comparator wherein said reference codes correspond to payments which are to be made;

wherein said disabling module disables the system that supports causing ignition when said code is not in agreement with said reference code before a predetermined time exceeds a predetermined deadline, and wherein the system that supports causing ignition includes only components not dedicated to directly causing a spark to initiate combustion.

* * * * *